

Algebra II

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2)	24	9)	6	8)	11,200
3)	20	10)	9	10)	49 m/s
4)	22.5	11)	$6\sqrt{2}$	12)	$16^\circ\text{C}/\text{min}$
5)	75	12)	$5\sqrt{3}$	14)	5040 newtons
6)	48	2)	\$ 18.20	16)	64 ft
7)	50	4)	160 newtons		
8)	3	6)	810 g can		

$$2) \quad x = kt \quad \frac{3}{8} \cdot 64 = t \cdot \frac{8}{3} \cdot \frac{3}{8}$$

$$40 = k \cdot 15$$

$$\frac{8}{3} = \frac{40}{15} = k$$

$$\boxed{24 = t}$$

$$6) \quad y = k\sqrt{x}$$

$$25 = k\sqrt{3}$$

$$\frac{25}{\sqrt{3}} = k$$

$$(100 = \frac{25}{\sqrt{3}} \cdot \sqrt{x}) \cdot \frac{\sqrt{3}}{25}$$

$$(4\sqrt{3})^2 = (\sqrt{x})^2$$

$$16 \cdot 3 = x$$

$$48 = x$$

$$9) \quad \left(\frac{2}{b} = \frac{b}{18}\right) 18b$$

$$\sqrt{36} = \sqrt{b^2}$$

$$6 = |b|$$

$$\boxed{6}$$

$$11) \quad \left(\frac{9}{b} = \frac{b}{8}\right) 8b$$

$$\sqrt{72} = \sqrt{b^2}$$

$$\sqrt{36 \cdot 2} = b$$

$$6\sqrt{2} = b$$

- 2) If the sales tax on a \$60 purchase is \$3.90, what would it be on a \$280 purchase?

- 4) The acceleration of an object varies directly as the force acting on it. If a force of 240 newtons causes an acceleration of 150 m/s^2 , what force will cause an acceleration of 100 m/s^2 ?

$$a = kF$$

$$150 = k \cdot 240$$

$$\frac{150}{240} = k$$

$$a = \frac{5}{8}F$$

$$100 = \frac{5}{8}F$$

$$160 = F$$

$$\boxed{160 \text{ n}}$$

- 6) At the Gourmet Grocery Mart, a 575 g can of green beans cost 39 cents and a 810 g can of the same product costs 52 cents. Which is the better buy?

$$\frac{39^{\text{¢}}}{575 \text{ g}} = 0.067 \frac{\text{¢}}{\text{g}}$$

$$\frac{52^{\text{¢}}}{810 \text{ g}} = 0.064 \frac{\text{¢}}{\text{g}}$$

8) A public-opinion poll found that of a sample of 450 voters, 252 favored a school bond measure. If 20,000 persons vote, about how many are likely to vote for the bond measure?

$$252 = k \cdot 450$$

$$\frac{252}{450} = k$$

$$0.56 = k$$

$$f = 20000(0.56)$$

$$f = 11,200 \text{ persons.}$$

10) The speed of an object falling from rest in a vacuum is directly proportional to the time it has fallen. After an object has fallen for 1.5 s, its speed is 14.7 m/s. What is its speed after it has fallen 5 s?

$$v = kt$$

$$14.7 = k(1.5)$$

$$9.8 = k$$

$$v = 9.8t$$

$$v = 9.8(5)$$

$$v = 49 \text{ m/s}$$

12) Newton's law of cooling states that the rate at which an object cools varies directly as the difference between its temperature and the temperature of the surrounding air. At the moment a steel plate at 270°C is placed in air that is 20°C, its rate of cooling is 50°C/min. How fast is it cooling when its temperature is 100°C?

$$r = k(T - T_A)$$

$$50 = k(270 - 20)$$

$$50 = 250k$$

$$\frac{1}{5} = \frac{50}{250} = k$$

$$r = \frac{1}{5}(T - T_A)$$

$$r = \frac{1}{5}(100 - 20)$$

$$r = \frac{1}{5}(80)$$

$$r = 16^\circ\text{C/min}$$

14) The centrifugal force acting on an object moving in a circle is directly proportional to the square of the speed of the object. If the force is 2240 newtons when the object is moving at 8 m/s, what is the force when the object is moving at 12 m/s?

16) The speed of an object falling from rest is directly proportional to the square root of the distance the object has fallen. When an object has fallen 36 ft, its speed is 48 ft/s. How much farther must it fall before its speed is 80 ft/s?

$$v = k\sqrt{d}$$

$$48 = k\sqrt{36}$$

$$48 = 6k$$

$$8 = k$$

$$v = 8\sqrt{d}$$

$$80 = 8\sqrt{d}$$

$$10 = \sqrt{d}$$

$$100 = d$$

$$100 \text{ ft}$$

$$100 - 36 = 64 \text{ ft}$$